PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 030157WO	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US04/06737	International filing date *(day/month/year)* 04 March 2004 (04.03.2004)	Priority date *(day/month/year)* 05 March 2003 (05.03.2003)
International Patent Classification (IPC) or national classification and IPC IPC(7): H04M 1/66, 1/68 and US Cl.: 455/411		
Applicant QUALCOMM INC.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 10 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of _____ sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))
      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

CORRECTED VERSION

4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
04 October 2004 (10.10.2004)	10 June 2005 (10.06.2005)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Pierre-louis Desir Telephone No. (571) 272-7799

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/06737

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1(b))

☐ publication of the international application (under Rule 12.4)

☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☒ the description:
pages 1-32 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the claims:
pages 33-39 as originally filed/furnished
pages* NONE as amended (together with any statement) under Article 19
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the drawings:
pages 1/15 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages NONE
☒ the claims, Nos. NONE
☒ the drawings, sheets/figs NONE
☒ the sequence listing (*specify*): NONE
☒ any table(s) related to the sequence listing (*specify*): NONE

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

** If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/06737

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims Please See Continuation Sheet	YES
	Claims Please See Continuation Sheet	NO
Inventive Step (IS)	Claims Please See Continuation Sheet	YES
	Claims Please See Continuation Sheet	NO
Industrial Applicability (IA)	Claims Please See Continuation Sheet	YES
	Claims Please See Continuation Sheet	NO

2. Citations and Explanations (Rule 70.7)
Please See Continuation Sheet

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

V.1. Reasoned Statements:
The opinion as to Novelty was positive (Yes)with respect to claims NONE
The opinion as to Novelty was negative (No) with respect to claims 1, 5-9, 11-12, 14, 16-18, 21-25, 29-30, 32, 34-36, 42-43
The opinion as to Inventive Step was positive (Yes)with respect to claims NONE
The opinion as to Inventive Step was negative(NO) with respect to claims 1-43
The opinion as to Industrial Applicability was positive (YES) with respect to claims 1-43
The opinion as to Industrial Applicability was negative(NO) with respect to claims NONE

V. 2. Citations and Explanations:

1. Claims1, 5-9, 11-12, 14, 16-18, 21-25, 29-30, 32, 34-36, 42-43 lack novelty under PCT Article 33(2) as being anticipated by Papadimitriou et al. (Papadimitriou), U.S. Patent No. 6385458.

Regarding claim 1, Papadimitriou discloses a method of providing location services (LCS) (see abstract), comprising: performing location determination via a first set of at least one network entity to obtain location information for a mobile station (i.e., a user request the location of the terminal device. The LCS algorithm will receive this request in a location request. If the location request detects that the user has entered a highest priority request, such as an emergency number, then the location request immediately proceeds to determine the location of the terminal device, and proceeds to a GMLC location estimate request. In the GMLC location estimate request, a GMLC receives a location estimation request from a user and recognizes that the device being sought is currently in its network. Accordingly, the GMLC then sends a request for location information towards the terminal device, and more specifically, towards the LMUs servicing the terminal device being sought. While the request for location estimation is being sent towards the LMU, it will be processed) (see col. 5, lines 56 -64; col. 6, lines 23-30); and performing location disclosure via a second set of at least one network entity to provide the location information for the mobile station (i.e., the LMUs servicing the terminal device use the priority information generated in the GMLC location estimate request to estimate the location of the terminal device to a predetermined precision in a location estimate. After the LMUs estimate the location of the terminal device, the LMUs return the location estimate to the GMLC in a LMU response. Then, in a report location estimate, the GMLC sends the location estimate to the user who requested the location estimate, and the LCS algorithm terminates) (see col. 6, lines 41-55).

Regarding claim 5, Papadimitriou discloses a method, wherein the location determination and the location disclosure are performed in two separate LCS sessions (see col. 5, lines 56 -64 col. 6, lines 23-30; col. 6, lines 41-55).

Regarding claim 6, Papadimitriou discloses a method further comprising: caching the location information for the mobile station, and wherein the location disclosure is performed using the cached location information for the mobile station (i.e., Papadimitriou discloses an MSC in both the originating and the destination networks, which include a VLR for maintaining a register of information (location information is stored in the register) for all mobile phone currently served by the respective network. Furthermore, a disclosed LMU, which measures the distance between the mobile phone and the LMU and reports the distance to a base station controller. The network is connected through the MSC to a GMLC. The GMLC interfaces to users of a location service that is seeking the location of a mobile phone, performs user authorization tasks, and forwards positioning request to the mobile phone's current mobile network (see col. 1, lines 49-65, col. 2, lines 11-24).

Regarding claim 7, Papadimitriou discloses a method, wherein the first set of at least one network entity is located in a serving network for the mobile station (see col. 1, lines 66-67, and col. 2, lines 1-5) and the second set of at least one network entity is

located in a home network for the mobile station (see col. 1, lines 45-57).

Regarding claim 8, Papadimitriou discloses a method, wherein the location disclosure is performed by a location client and a location server (i.e., a method is disclosed in which a computer program has a location request module for receiving a location request from a user, a location request processing module that makes a location estimate with an accuracy based on a priority level associated with the user, and a terminal device location estimation reporting module that communicates the location estimate to the user) (see col. 4, lines 63-67, and col. 5, lines 1-2).

Regarding claim 9, Papadimitriou discloses a method, wherein the second set of at least one network entity includes an LCS provider (i.e., GMLC) (see col. 1, lines 60-65), and wherein the location client is located in the mobile station (i.e., as understood from the specification, the location client requests location information; with Papadimitriou discloses that the GMLC interfaces to users of a location service that is seeking the location of a mobile phone, one skilled in the art would unhesitatingly conceptualize that the location client is located in the mobile station) (see col. 1 lines 60-63).

Regarding claim 11, Papadimitriou discloses a method (refer to claim 1 reasoning), wherein the first set of at least one network entity includes a position determining entity (PDE) (i.e., LMU) (see col. 6, lines 28-30)

Regarding claim 12, Papadimitriou discloses a method (refer to claim 11 reasoning), wherein the first set of at least one network entity further includes a serving mobile positioning center (SMPC) (i.e., SMLC) (see col. 5, lines 5-9).

Regarding claim 14, Papadimitriou discloses a method (refer to reasoning of claim 1), wherein the second set of at least one network entity includes an LCS server (i.e., LCS algorithm) (see col. 5, lines 47-48).

Regarding claim 16, Papadimitriou discloses a method as described in the reasoning of claim 1, wherein the location information for the mobile station comprises a location estimate for the mobile station (see abstract).

Regarding claim 17, Papadimitriou discloses a method as described in the reasoning of claim 1, wherein the location information for the mobile station comprises an uncertainty for the location estimate for the mobile station (i.e., Papadimitriou discloses the primary task of the SMLC is to decide upon a positioning method to use to estimate the location of a mobile phone. Furthermore, knowing that estimation can be considered as a rough calculation, both uncertainty and accuracy may be comprised in estimation) (see col. 2, lines 5-8).

Regarding claim 18, Papadimitriou discloses an apparatus comprising: means for performing location determination via a first set of at least one network entity to obtain location information for a mobile station (i.e., a user request the location of the terminal device. The LCS algorithm will receive this request in a location request. If the location request detects that the user has entered a highest priority request, such as an emergency number, then the location request immediately proceeds to determine the location of the terminal device, and proceeds to a GMLC location estimate request. In the GMLC location estimate request, a GMLC receives a location estimation request from a user and recognizes that the device being sought is currently in its network. Accordingly, the GMLC then sends a request for location information towards the terminal device, and more specifically, towards the LMUs servicing the terminal device being sought. While the request for location estimation is being sent towards the LMU, it will be processed) (see col. 5, lines 56 -64; col. 6, lines 23-30); and means for performing location disclosure via a second set of at least one network entity to provide the location information for the mobile station (i.e., the LMUs servicing the terminal device use the priority information generated in the GMLC location estimate request to estimate the location of the terminal device to a predetermined precision in a location estimate. After the LMUs estimate the location of the terminal device, the LMUs return the location estimate to the GMLC in a LMU response. Then, in a report location estimate, the GMLC sends the location estimate to the user who requested the location estimate, and the LCS algorithm terminates) (see col. 6, lines 41-55).

Regarding claim 21, Papadimitriou discloses an apparatus further comprising: caching the location information for the mobile station, and wherein the location disclosure is performed using the cached location information for the mobile station (i.e., Papadimitriou discloses an MSC (in both the originating and the destination networks) which include a VLR for maintaining a register of information (location information is stored in the register) for all mobile phone currently served by the respective network. Furthermore, a disclosed LMU, which measures the distance between the mobile phone and the LMU and reports the distance to a base station controller. The network is connected through the MSC to a GMLC. The GMLC interfaces to users of a location service that is seeking the location of a mobile phone, performs user authorization tasks, and forwards positioning request to the mobile phone's current mobile network (see col. 1, lines 49-65, col. 2, lines 11-24).

Regarding claim 22, Papadimitriou discloses a wireless mobile station (i.e. terminal device) (see abstract) comprising (i.e., that implements): a processor (an inherently integral part of the mobile station) operative to perform a first function to obtain location information for the mobile station and to perform a second function to provide the location information, wherein the first function interacts with at least one peer first function located in a first set of at least one network entity to obtain the location information, and wherein the second function interacts with at least one peer second function located in a second set of at least one network entity to provide the location information (see col. 5, lines 56 -64; col. 6, lines 23-30; col. 6, lines 41-55; also refer to reasoning of claim 1).

Regarding claim 23, Papadimitriou discloses a program product embodied on a tangible storage medium (see abstract), the program comprising executable instructions to: perform a first function to obtain location information for the mobile station, wherein the first function interacts with at least one peer first function located in a first set of at least one network entity to obtain the location information; and perform a second function to provide the location information, wherein the second function interacts with at least one peer second function located in a second set of at least one network entity to provide the location information (see col. 4, lines 60-67; col. 5, lines 56 -64; col. 6, lines 23-30; col. 6, lines 41-55; also refer to reasoning of claim 1).

Regarding claim 24, Papadimitriou discloses a method of providing location services (LCS) (see abstract), comprising: performing location determination via a first LCS session to obtain location information for a mobile station (i.e., a user request the

Supplemental Box

location of the terminal device. The LCS algorithm will receive this request in a location request. If the location request detects that the user has entered a highest priority request, such as an emergency number, then the location request immediately proceeds to determine the location of the terminal device, and proceeds to a GMLC location estimate request. In the GMLC location estimate request, a GMLC receives a location estimation request from a user and recognizes that the device being sought is currently in its network. Accordingly, the GMLC then sends a request for location information towards the terminal device, and more specifically, towards the LMUs servicing the terminal device being sought. While the request for location estimation is being sent towards the LMU, it will be processed) (see col. 5, lines 56 -64; col. 6, lines 23-30); and performing location disclosure via a second LCS session to provide the location information for the mobile station (i.e., the LMUs servicing the terminal device use the priority information generated in the GMLC location estimate request to estimate the location of the terminal device to a predetermined precision in a location estimate. After the LMUs estimate the location of the terminal device, the LMUs return the location estimate to the GMLC in a LMU response. Then, in a report location estimate, the GMLC sends the location estimate to the user who requested the location estimate, and the LCS algorithm terminates) (see col. 6, lines 41-55).

Regarding claim 25, Papadimitriou discloses a method (refer to reasoning of claim 24), wherein the first and second LCS sessions are performed at different times (i.e., a user will request the location of the terminal device. The LCS algorithm will receive this request in a location request step, which immediately proceeds to determine the location of the terminal device, and proceeds to a GMLC location estimate request step (i.e., In the GMLC location estimate request step 235, a GMLC receives a location estimation request from a user and recognizes that the device being sought is currently in its network. Accordingly, the GMLC then sends a request for location information towards the terminal device, and more specifically, towards the LMUs servicing the terminal device being sought. The LMUs servicing the terminal device will receive the request for location information in a LMU location estimate receipt step. (Second performance at another time) the LMUs servicing the terminal device use the priority information generated in the GMLC location estimate request step to estimate the location of the terminal device to a predetermined precision in a location estimate step. After the LMUs estimate the location of the terminal device, the LMUs return the location estimate to the GMLC in a LMU response step. Then, in a report location estimate step, the GMLC sends the location estimate to the user who requested the location estimate, and the LCS algorithm terminates) (see col. 5, lines 56 -64; col. 6, lines 23-30; col. 6, lines 41-55).

Regarding claim 29, Papadimitriou discloses an apparatus comprising: means for performing location determination via a first LCS session to obtain location information for a mobile station (see col. 5, lines 56 -64; col. 6, lines 23-30); and means for performing location disclosure via a second LCS session to provide the location information for the mobile station (see col. 6, lines 41-55).

Regarding claim 30, Papadimitriou discloses a method of providing location services (LCS), comprising: obtaining location information for a mobile station (i.e., a user request the location of a terminal device; the LMUs return the location estimate to the GMLC in a LMU response step. Then in a report location estimate step, the GMLC sends the location estimate) (see col. 5, lines 56-57; col. 6, lines 51-56); providing the location information to a first application (i.e., originating network) (see col. 1, line 26); and providing the location information to a second application (destination network) (see col. 1, lines 34-36).

Regarding claim 32, Papadimitriou discloses a method refer to claim 30 reasoning) further comprising: caching the location information in mobile station or a network entity (i.e., Papadimitriou discloses an MSC in both the originating and the destination networks which include a VLR for maintaining a register of information (location information is stored in the register) for all mobile phone currently served by the respective network) (see col. 1, lines 49-65).

Regarding claim 34, Papadimitriou discloses a method (refer to claim 30 reasoning) wherein the first application is located in a first network (see col. 1, lines 41-47) and the second application is located in a second network (see col. 2, lines 18-25).

Regarding claim 35, Papadimitriou discloses an apparatus comprising: means for obtaining location information for a mobile station (i.e., a user request the location of a terminal device; the LMUs return the location estimate to the GMLC in a LMU response step. Then in a report location estimate step, the GMLC sends the location estimate) (see col. 5, lines 56-57; col. 6, lines 51-56); means for providing the location information to a first application (i.e., originating network) (see col. 1, line 26); and means for providing the location information to a second application (destination network) (see col. 1, lines 34-36).

Regarding claim 36, Papadimitriou discloses a method of providing location services (LCS), comprising: performing location determination via at least one network entity in a serving network to obtain location information for a mobile station (see col. 1, lines 66-67, and col. 2, lines 1-5; col. 5, lines 56 -64; col. 6, lines 23-30); and performing location disclosure via at least one network entity in a home network to provide the location information for the mobile station (see col. 1, lines 45-57; col. 6, lines 41-55).

Regarding claim 42, Papadimitriou discloses a method further comprising: caching the location information in the mobile station, a network entity in the serving network, a network entity in the home network, or a combination thereof (see col. 1, lines 49-65).

Regarding claim 43, Papadimitriou discloses an apparatus comprising: means for performing location determination via at least one network entity in a serving network to obtain location information for a mobile station (see col. 1, lines 66-67, and col. 2, lines 1-5; col. 5, lines 56 -64; col. 6, lines 23-30); and means for performing location disclosure via at least one network entity in a home network to provide the location information for the mobile station (see col. 1, lines 45-57; col. 6, lines 41-55).

2. Claims 13, 15, and 31 lack an inventive step under PCT Article 33(3) as being obvious over Papadimitriou.

Supplemental Box

Regarding claim 13, Papadimitriou discloses a method as described in claim 11 reasoning.

Although Papadimitriou discloses a method as described above, Papadimitriou fails to specifically disclose a method wherein the first set of at least one network entity further includes a home authentication, authorization, and accounting (H-AAA) entity.

However, Papadimitriou discloses a method wherein at GMLC interfaces to users of a location service that is seeking the location of a mobile phone or other terminal device, performs user authorization tasks, and also forwards positioning requests to the mobile phone's current mobile network.

Therefore, (giving the fact that the GMLC performs user authorization tasks) it would have been obvious to one of ordinary skill at the time of the invention to modify the method so that it could include a home authentication, authorization, and accounting (H-AAA) entity. Such modification would have been considered a mere design consideration, which fails to patentably distinguish from the prior art.

Regarding claim 15, Papadimitriou discloses a method as described in claim 11 reasoning.

Although Papadimitriou discloses a method as described above, Papadimitriou fails to specifically disclose a method wherein the second set of at least one network entity further includes a home authentication, authorization, and accounting (H-AAA) entity.

However, Papadimitriou discloses a method wherein at GMLC interfaces to users of a location service that is seeking the location of a mobile phone or other terminal device, performs user authorization tasks, and also forwards positioning requests to the mobile phone's current mobile network.

Therefore, (giving the fact that the GMLC performs user authorization tasks) it would have been obvious to one of ordinary skill at the time of the invention to modify the method so that it could include a home authentication, authorization, and accounting (H-AAA) entity. Such modification would have been considered a mere design consideration, which fails to patentably distinguish from the prior art.

Regarding claim 31, Papadimitriou discloses a method as described in claim 30 reasoning. Papadimitriou also discloses a method wherein the location information is obtained by performing location determination once via one location determination session (see col. 5, lines 56 -64; col. 6, lines 23-30).

Although Papadimitriou discloses a method as described above, Papadimitriou fails to specifically disclose a method wherein the location information is provided to the first and second applications by performing location disclosure twice via two location disclosure sessions.

However, Papadimitriou discloses a method for providing location information to a first application, and to a second application (see claim 30 reasoning as referred to this claim).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to logically consider, giving the fact that applicant does not disclose the procedure for performing location disclosure twice via two location disclosure sessions, Papadimitriou disclosure of providing location information to the stated applications is achieved in two sessions. Furthermore, giving the fact that applicant does not disclose the procedure for performing location disclosure twice via two location disclosure sessions; it would have been obvious to one of ordinary skill in the art to modify Papadimitriou to perform according to the claimed invention. Such modification would have been considered a mere design consideration, which fails to patentably distinguish from the prior art.

3. Claims 2-4, and 19-20, 26-27, 37 lack an inventive step under PCT Article 33(3) as being obvious over Papadimitriou in view of Horn et al. (Horn), U.S. Patent No. 6064741.

Regarding claim 2, Papadimitriou discloses a method as described above (refer to claim 1 reasoning).

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to specifically disclose a method further comprising: performing authentication and authorization for location determination based on a first security procedure; and performing authentication and authorization for location disclosure based on a second security procedure.

However, Horn discloses a method for the exchange of cryptographic keys in a network computer unit an in a user computer unit, in which the following security mechanism is realized: agreement on the key between the user and the network with mutual implicit authentication, i.e. the method achieves the effect that, after completion of the procedure, a joint secret session key is available, of which each party knows that only the authentic counterpart can likewise be in possession of the secret session key (i.e., authentication and key agreement) (see col. 3, lines 44-50). Furthermore, a session key is calculated by the bit-by-bit application of the exclusive-OR function to the first interim key and the second interim key. A first response is formed by encoding a user constant, which is known both to the user computer and to the network computer unit, with the session key using a symmetric cryptographic function or a hash function or a one-way function. MD5 algorithm is a known n hash function (see col. 5, lines 20-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to insure the security of the location determination/disclosure procedure.

Regarding claim 3, Papadimitriou discloses a method as described in claim 2 reasoning.

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to specifically disclose a method, wherein the first security procedure is based on an MD-5 algorithm and the second security procedure is based on an Authentication and Key Agreement (AKA) procedure.

Supplemental Box

However, Horn discloses security measures based on both MD-5 algorithm and Authentication and Key Agreement (AKA) (see col. 3, lines 44-50; col. 5, lines 20-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to insure the security of the location determination/disclosure procedure.

Regarding claim 4, Papadimitriou discloses a method as described above (seen claim 1 reasoning).

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to specifically disclose a method, further comprising: performing a first session key setup to obtain a first session key, wherein the first session key is used for authentication and encryption of messages exchanged with the first set of at least one network entity; and performing a second session key setup to obtain a second session key, wherein the second session key is used for authentication and encryption of messages exchanged with the second set of at least one network entity.

However, Horn discloses a method wherein session key K is calculated by the bit-by-bit application of the exclusive-OR function to the first interim key K1 and the second interim key K2. A first response A Is formed by encoding a user constant, which is known both to the user computer and to the network computer unit, with the session key using a function a symmetric cryptographic function or a hash function or a one-way function (see col. 5, lines 20-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to insure the security of the location determination/disclosure procedure.

Regarding claim 19, Papadimitriou discloses an apparatus as described above (refer to claim 18 reasoning).

Although Papadimitriou discloses an apparatus as recited above, Papadimitriou fails to specifically disclose an apparatus further comprising: means for performing authentication and authorization for location determination based on a first security procedure; and means for performing authentication and authorization for location disclosure based on a second security procedure.

However, Horn discloses an apparatus wherein the exchange of cryptographic keys in a network computer unit an in a user computer unit, in which the following security mechanism is realized: agreement on the key between the user and the network with mutual implicit authentication, i.e. the method achieves the effect that, after completion of the procedure, a joint secret session key is available, of which each party knows that only the authentic counterpart can likewise be in possession of the secret session key (i.e., authentication and key agreement) (see col. 3, lines 44-50). Furthermore, a session key is calculated by the bit-by-bit application of the exclusive-OR function to the first interim key and the second interim key. A first response is formed by encoding a user constant, which is known both to the user computer and to the network computer unit, with the session key using a symmetric cryptographic function or a hash function or a one-way function. MD5 algorithm is a known n hash function (see col. 5, lines 20-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to insure the security of the location determination/disclosure procedure.

Regarding claim 20, Papadimitriou discloses an apparatus as described above (seen claim 18 reasoning).

Although Papadimitriou discloses an apparatus as recited above, Papadimitriou fails to specifically disclose an apparatus, further comprising: means for performing a first session key setup to obtain a first session key, wherein the first session key is used for authentication and encryption of messages exchanged with the first set of at least one network entity; and means for performing a second session key setup to obtain a second session key, wherein the second session key is used for authentication and encryption of messages exchanged with the second set of at least one network entity.

However, Horn discloses an apparatus wherein session key K is calculated by the bit-by-bit application of the exclusive-OR function to the first interim key K1 and the second interim key K2. A first response A is formed by encoding a user constant, which is known both to the user computer and to the network computer unit, with the session key using a function a symmetric cryptographic function or a hash function or a one-way function (see col. 5, lines 20-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to insure the security of the location determination/disclosure procedure.

Regarding claim 26, Papadimitriou discloses a method as described above (refer to claim 24 reasoning).

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to specifically disclose a method further comprising: performing authentication and authorization for location determination based on a first security procedure; and performing authentication and authorization for location disclosure based on a second security procedure.

However, Horn discloses a method for the exchange of cryptographic keys in a network computer unit an in a user computer unit, in which the following security mechanism is realized: agreement on the key between the user and the network with mutual implicit authentication, i.e. the method achieves the effect that, after completion of the procedure, a joint secret session key is available, of which each party knows that only the authentic counterpart can likewise be in possession of the secret session key (i.e., authentication and key agreement) (see col. 3, lines 44-50). Furthermore, a session key is calculated by the bit-by-bit application of the exclusive-OR function to the first interim key and the second interim key. A first response is formed by encoding a user constant, which is known both to the user computer and to the network computer unit, with the session key using a symmetric cryptographic function or a hash function or a one-way function. MD5 algorithm is a known n hash function (see col. 5, lines 20-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to insure the security of the location determination/disclosure

Supplemental Box

procedure.

Regarding claim 27, Papadimitriou discloses a method as described above (seen claim 24 reasoning).

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to specifically disclose a method, further comprising: performing a first session key setup to obtain a first session key for use in the first LCS session; and performing a second session key setup to obtain a second session key for use in the second LCS session.

However, Horn discloses a method wherein session key K is calculated by the bit-by-bit application of the exclusive-OR function to the first interim key K1 and the second interim key K2. A first response A is formed by encoding a user constant, which is known both to the user computer and to the network computer unit, with the session key using a function a symmetric cryptographic function or a hash function or a one-way function (see col. 5, lines 20-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to insure the security of the location determination/disclosure procedure.

Regarding claim 37, Papadimitriou discloses a method as described above (seen claim 36 reasoning).

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to specifically disclose a method, further comprising: performing a first session key setup to obtain a first session key, wherein the first session key is used for authentication and encryption of messages exchanged with the at least one network entity in the serving network; and performing a second session key setup to obtain a second session key, wherein the second session key is used for authentication and encryption of messages exchanged with the at least one network entity in the home network.

However, Horn discloses a method wherein session key K is calculated by the bit-by-bit application of the exclusive-OR function to the first interim key K1 and the second interim key K2. A first response A is formed by encoding a user constant, which is known both to the user computer and to the network computer unit, with the session key using a function a symmetric cryptographic function or a hash function or a one-way function (see col. 5, lines 20-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to insure the security of the location determination/disclosure procedure.

4. Claims 10 and 41 lack an inventive step under PCT Article 33(3) as being obvious over Papadimitriou in view of McDonnell et al. (McDonnell), Pub. No. 2002/0004399.

Regarding claim 10, Papadimitriou discloses a method as described in claim 8 reasoning (refer to claim 8 reasoning).

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to disclose a method wherein the second set of at least one network entity includes an LCS server (i.e., LCS algorithm) (see col. 5, lines 47-48), Papadimitriou fails to specifically disclose a method, wherein the location server is located in the mobile station or the LCS server.

However, McDonnell discloses a method the location-aware service may reside in the mobile entity whose location is of interest, in a network-connected service system, or even in another mobile entity (see page 3, paragraph 28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to assist the system in making the necessary location determinations.

Regarding claim 41, Papadimitriou discloses a method as described in claim 36 reasoning (refer to claim 36 reasoning).

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to disclose a method, further comprising: sending a message to the mobile station to trigger the mobile station to initiate a LCS session for performing location determination.

However, McDonnell discloses a method where the location determination may be triggered by the location server in response to the service request from the mobile entity or the mobile entity may, immediately prior to making request, directly trigger BSC to effect a location determination and feed the result to location server (see page 3, paragraph 26).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation to do so would have been to assist the system in making the necessary location determinations.

5. Claims 28, 33 lacks an inventive step under PCT Article 33(3) as being obvious over Papadimitriou in view of Deloach et al. (Deloach), Pub. No. 2003/0125044.

Regarding claim 28, Papadimitriou discloses a method as described in claim 24 reasoning (refer to claim 24 reasoning).

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to disclose a method, further comprising: providing a first call detail record (CDR) for the first LCS session; and providing a second CDR for the second LCS session.

However, Deloach discloses a method for the determination of the positions of wireless mobile stations in a mobile communication network, in which When there is a physical change in the cellular infrastructure or in the cellular infrastructure configuration, the base station almanac data base server maintains records in the base station almanac data base reflecting both the old and new conditions until all of the PDEs are switched over to the new conditions (see page 2, paragraph 16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts, which are analogous art because they are from the same field of endeavor, to arrive at the claimed invention. A motivation to do so would have been to ensure accuracy and completeness of the record.

Regarding claim 33, Papadimitriou discloses a method as described in claim 30 reasoning (refer to claim 30 reasoning).

Supplemental Box

Although Papadimitriou discloses a method as recited above, Papadimitriou fails to disclose a method, further comprising: providing a first call detail record (CDR) for providing the location information to the first application; and providing a second CDR for providing the location information to the second application.

However, Deloach discloses a method for the determination of the positions of wireless mobile stations in a mobile communication network, in which When there is a physical change in the cellular infrastructure or in the cellular infrastructure configuration, the base station almanac data base server maintains records in the base station almanac data base reflecting both the old and new conditions until all of the PDEs are switched over to the new conditions (see page 2, paragraph 16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts, which are analogous art because they are from the same field of endeavor, to arrive at the claimed invention. A motivation to do so would have been to ensure accuracy and completeness of the record.

6. Claims 38-40 lack an inventive step under PCT Article 33(3) as being obvious over Papadimitriou in view of Haverinen et al. (Haverinen), Pub. No. 2003/0119481.

Regarding claim 38, Papadimitriou discloses a method as described in claim 36 reasoning (refer to claim 36 reasoning), wherein the at least one network entity in the serving network includes a serving mobile positioning center (SMPC) (i.e., SMLC) (see col. 5, lines 5-9).

Although Papadimitriou discloses a method as described above, Papadimitriou fails to specifically disclose a method further comprising: determining an Internet Protocol (IP) address of the SMPC.

However, Haverinen discloses a method wherein after the MS has selected a PLMN, it can transmit a request to the local network BAN for setting up a connection with a network element according to the network element identifier linked with the identifier of the selected PLMN. The local network BAN finds out the IP address of the network element (see page 4, paragraph 43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both teachings, which are analogous, to arrive at the claimed invention. A motivation to do so would have been to provide a proper arrangement for the request procedure.

Regarding claim 39, Papadimitriou discloses a method as described in claim 36 reasoning (refer to claim 36 and 38 reasoning).

Although Papadimitriou discloses a method as described above, Papadimitriou fails to specifically disclose a wherein the IP address of the SMPC is determined using a fully qualified domain name for the SMPC.

However, Haverinen discloses a method wherein The local network BAN finds out the IP address of the network element from the network identifier, which is typically a domain name, (see page 4, paragraph 43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both teachings, which are analogous, to arrive at the claimed invention. A motivation to do so would have been to provide a proper arrangement for the request procedure.

Regarding claim 40, Papadimitriou discloses a method (refer to claims 36, and 38 reasoning) wherein the location disclosure is performed via the SMPC (i.e., the GMLC communicates with a Serving Mobile Location Center (SMLC) via Mobile Application Part (MAP) messaging. The SMLC (i.e. SMPC) provides the network resources needed to process calls in the network, and particularly to locate a mobile phone, and is directly associated with the MSC communicating with a mobile station that is being located) (see col. 1, line 66-67; col. 2, lines 1-5).